Idle Limiter User Manual

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Circuitlink IdleLimiter

The Circuitlink IdleLimiter is a innovative and simple device that does not require extensive user interaction. This manual will simply describe the function of the IdleLimiter and information on how the unit operates.

The IdleLimiter is designed to minimize engine wear and fuel wastage by shutting off the engine after a user specified time. This means that when a driver or vehicle operator leaves the vehicle engine running while unattended (in a depot for example) or needs to leave the driver seat for vehicle inspection that the vehicle will automatically save the fuel being burned

The unit operates by detecting the movement and engine RPM to determine if the vehicle is progressing towards over idling and counts the minutes until shutting the engine off.

User Interface

"Engine Run" LED

This LED matchs the "Engine Run" status (i.e. LED on if the engine is allowed to run; LED off if the engine is being prevented from running). The only exception is that the LED is always off when ignition is off (similar to the "Engine Run" output always being low in this state).

Status LED

The status LED on the box represents the current state of the unit and matches the External Status Output.

The various LED flash patterns are:

State	**Pattern**
Ignition Off	On for 500ms, Off for 500ms
Engine Off	On for 200ms, Off for 100ms, On for 200ms, Off for 500ms
Moving	On solid
Idling	Every 20 seconds flash the number of minutes till shutdown (200ms on/off for each minute left). N.B. At ≥ 50 minutes left, this will look like continuous flashing (200ms on/off).
Idle Stopped	On for 800ms, Off for 200ms
Engine Stopped	On for 200ms, Off for 800ms

Buzzer

If the setting "Give Warning Beeps" is enabled, the buzzer will warn the driver of the impending shutdown.

The internal and external buzzers sound at the same time.

With 2 minutes to go till shutdown, the unit beeps for 1 second.

With 1 minute to go till shutdown, the unit beeps twice (1second on, 500ms off, 1 second on).

With 45 seconds to go till shutdown, the unit beeps three times (1second on, 500ms off, 1 second on, 500ms off, 1 second on).

With 30 seconds to go till shutdown, the unit beeps four times (1second on, 500ms off, 1 second on, 500ms off, 1 second on, 500ms off, 1 second on).

With 15 seconds to go, the unit beeps constantly (1 second on, 500ms off) until the engine stops.

When the engine stops the unit will give a long beep (5 seconds).

Wiring Instructions

Input Cable

The table below show the input cable colours:

Input	Colour	Comment
Ground	Green	Connects to the vehicle ground
Power	Red	Connects to the vehicle supply. It is designed for 12 & 24V vehicles.
Ignition	Yellow	Connects to a signal that is on with the ignition – this is how the IdleLimiter knows the engine should be running.
RPM	Blue	Connects to a RPM signal – this is how the IdleLimiter knows if the vehicle is moving.
Engine Run	Black	Max 1A, same voltage as "power"
Buzzer	Brown	Max 1A, same voltage as "power"
Status Indicator	Purple	Max 40mA, same voltage as "power"
Speed	White	Connects to a Speed signal – this is how IdleLimiter knows if the vehicle is moving.

Ignition / Speed / RPM

These signals must be connected for the unit to operate correctly.

The voltage sensitivity of the speed/RPM signals can be configured (see "Settings" chapter) to accommodate different types of sensors.

The ignition input must be connected to at least 10V when the ignition switch is on. The unit will not operate correctly if the ignition input is not connected.

Engine Run

The Engine Run output is designed to power a relay which will control the engine. It is not designed to power the engine directly.

When the Ignition input is “off” power to this output will be removed, regardless of how it is configured. This is done to reduce the drain on the vehicle battery (since leaving a relay on all the time would draw more current) and to extend the life of the relay.

Relay Terminals

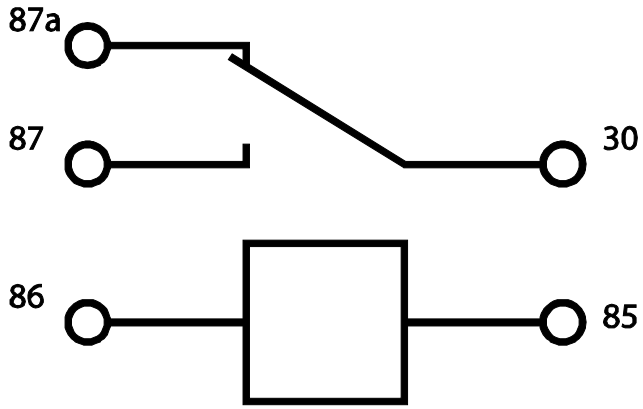

Figure 1

Terminals **85**/**86** are the coil for the relay. When power is applied to these terminals the relay switches.

Terminal **30** is a common terminal for the switched signal. When the relay coil power is removed, terminal **30** is connected to terminal **87a** (called the “normally closed” terminal because it is closed when there is no power). When relay coil power is applied terminal **30** is connected to terminal **87** (called the “normally open” terminal because it is open when there is no power

Relay can be configured in at least four ways, as shown below.

Relay Configuration 1

In this configuration the IdleLimiter stops the engine by cutting power to it. The engine is connected via the “normally closed” terminals on the relay.

When the IdleLimiter wishes to stop the engine it powers the relay, breaking power to the engine.

In this configuration the engine will run normally if the IdleLimiter is unplugged.

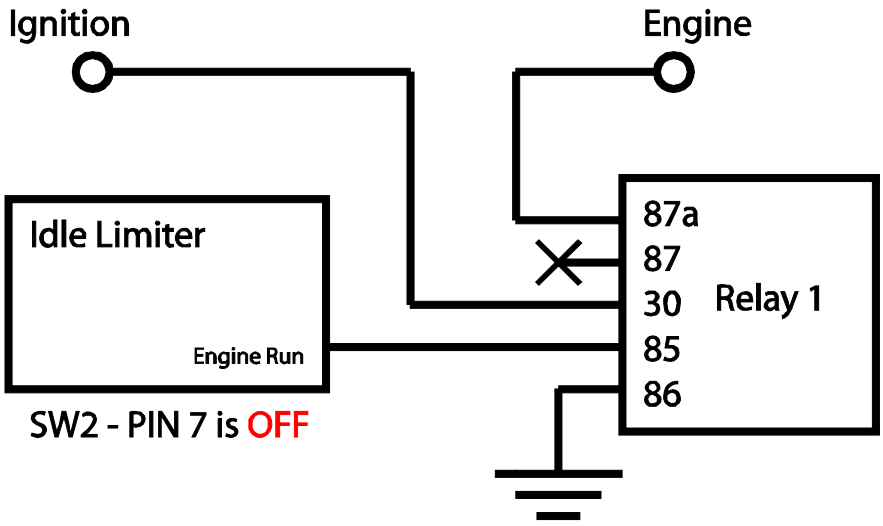

Figure 2

Relay Configuration 2

In this configuration the IdleLimiter keeps the engine running by supplying power to the relay. The engine is connected via the “normally open” terminals on the relay.

When the ignition is turned on the IdleLimiter will power up the relay, enabling the engine to run. When the IdleLimiter wishes to stop the engine it will remove power from the relay, breaking power to the engine.

In this configuration the engine will not run if the IdleLimiter is unplugged.

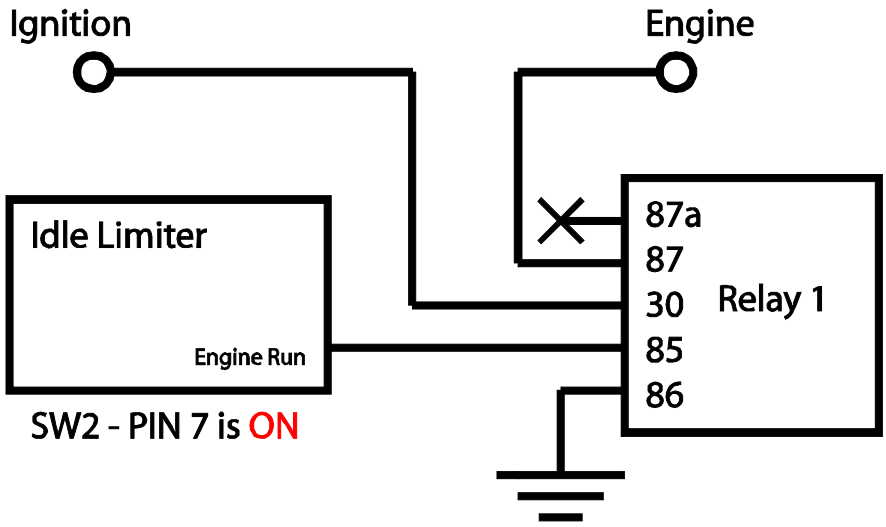

Figure 3

Relay Configuration 3

In this configuration the IdleLimiter controls a fuel cut-off solenoid which is normally open (ie will let fuel pass when there is no power applied and will stop fuel passing when power is applied). The solenoid is connected to the “normally open” terminals on the relay.

When the IdleLimiter wishes to stop the engine it powers the relay, switching power to the fuel solenoid and cutting fuel to the engine.

In this configuration the engine will run normally if the IdleLimiter is unplugged.

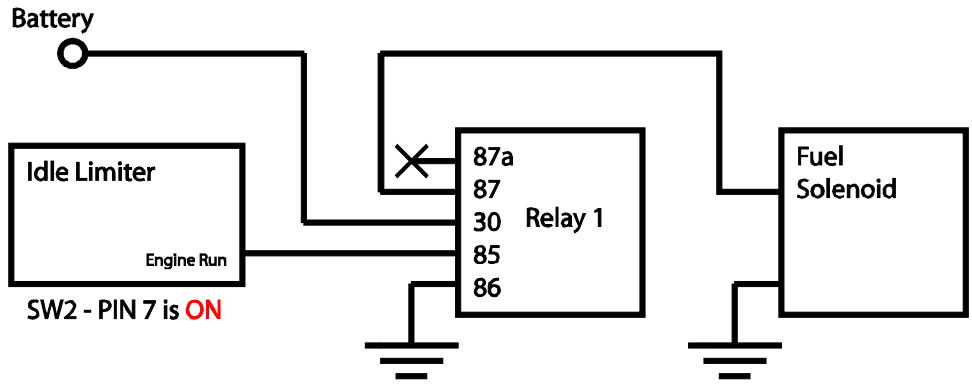

Figure 4

Relay Configuration 4

In this configuration the IdleLimiter controls a fuel cut-off solenoid which is normally closed (ie will let fuel pass when there is power applied and will stop fuel passing when no power is applied). The solenoid is connected to the “normally closed” terminals on the relay.

When the ignition is turned on the IdleLimiter will power up the relay, powering the solenoid and allowing fuel to reach the engine. When the IdleLimiter wishes to stop the engine it will remove power from the relay, stopping fuel to the engine.

In this configuration the engine will not run if the IdleLimiter is unplugged.

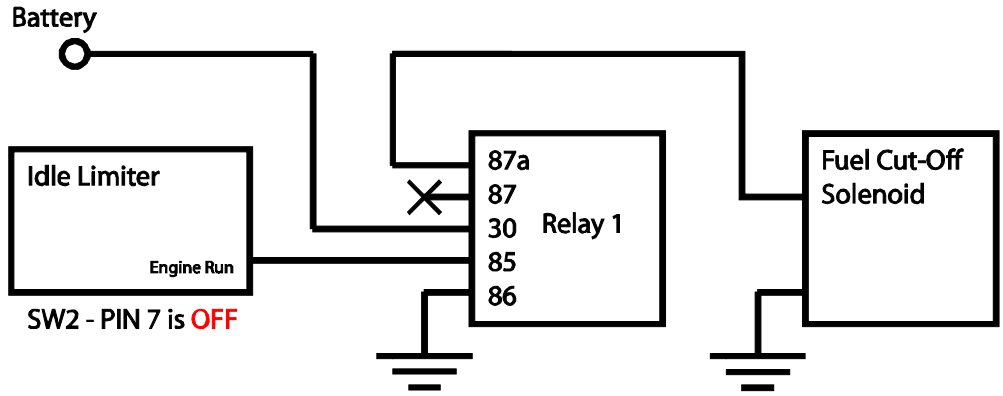

Figure 5

Buzzer

The buzzer output will turn on at the same time as the internal buzzer sounds. The output can be used to drive another visual/audible indicator so that the vehicle operator knows the engine is about to shut down.

This output can supply 1A at the input voltage – if the indicator current is likely to be near or above this then an external relay will need to be used.

Status Indicator

The status indicator output will turn on at the same time as the status LED on the unit. This output can provide 40mA at the input voltage and, if required, should be connected to an indicator that the vehicle operator knows the IdleLimiter if functioning correctly.

Settings

Settings are configured by opening the unit and adjusting the switches located on the circuit board

In order to configure the engine cut-off delay you must use SW1 and SW2.

SW1

PIN	Setting	If Switch is On
4	RPM Tolerance	Tolerance setting +2
3	RPM Tolerance	Tolerance setting +1
2	Speed Tolerance	Tolerance setting +2
1	Speed Tolerance	Tolerance setting +1

SW2

PIN	Setting	If Switch is On
8	Give Warning Beeps	Warning beeps enabled
7	Engine Run Power Type	Output high=allow engine to run
6	Idle Time	Idle time +32 minutes
5	Idle Time	Idle time +16 minutes
4	Idle Time	Idle time +8 minutes
3	Idle Time	Idle time +4 minutes
2	Idle Time	Idle time +2 minutes
1	Idle Time	Idle time +1 minute

Open the unit by unscrewing the four screws on the rear of the unit.

The circuit board is attached to the underside of the top of the unit.

The circuit board looks like the following:

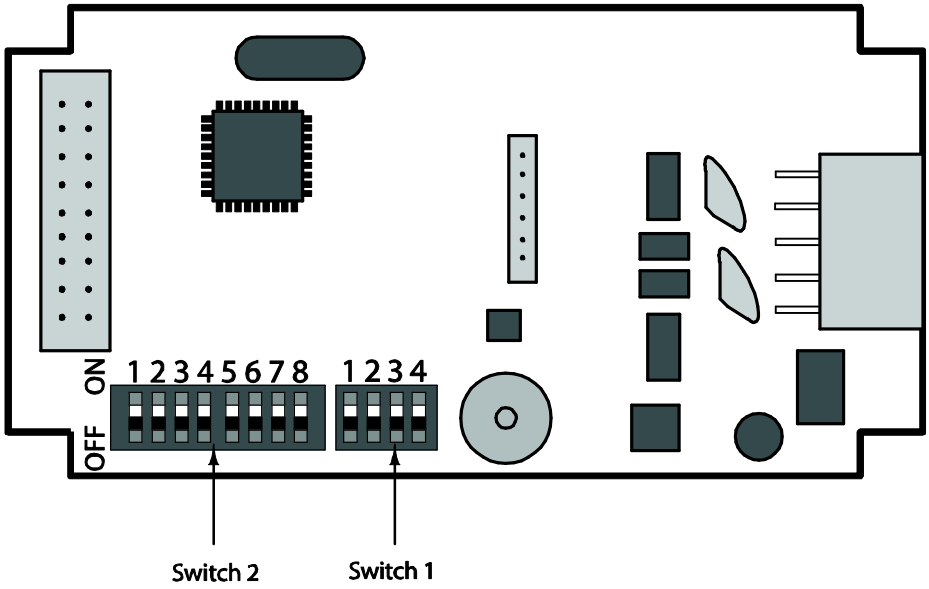

Figure 6 – IdleLimiter configuration switches

Multi-Switch Settings

Some configuration settings are set by multiple switches (i.e. RPM Tolerance, Speed Tolerance, Idle Time). For these settings, the set value is the sum of the values assigned to each individual switch.

For example, an idle time of 19 minutes can be set by turning pins 5, 2 and 1 on SW2 to “on” and pins 6, 4 and 3 to “off”, as this gives an idle time value of 16 minutes + 2 minutes + 1 minute = 19 minutes.

There are therefore 4 different tolerance settings for each of RPM and Speed: 0, 1, 2 and 3.

Settings

RPM Sensitivity

Sets how sensitive the RPM input is, i.e. the voltage change that is required for the engine to be “running”.

Higher numbers mean it is less sensitive, i.e. requires larger voltage changes to register the engine running.

Speed Sensitivity

Sets how sensitive the Speed input is, i.e. the voltage change that is required for the vehicle to be “moving”.

Higher numbers mean it is less sensitive, i.e. requires larger voltage changes to register the vehicle as moving.

Give Warning Beeps

The warning beeps can be enabled or disabled.

Engine Run Power Type

This can be set as “output high” = “allow engine to run” or “output high” = “stop engine”.

Idle Time

Sets the idle time, i.e. the time the vehicle is allowed to idle before stopping its engine.

Revision History

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- Created